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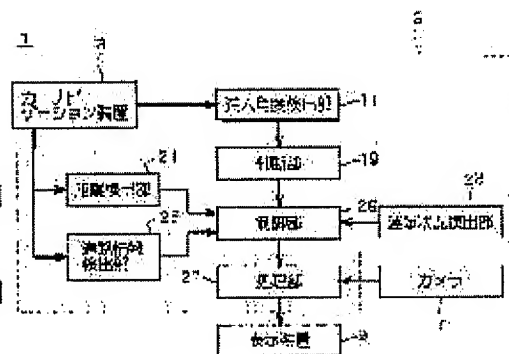
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(54) VEHICLE CIRCUMFERENCE MONITORING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a vehicle circumference monitoring device for preventing a pick-up image in the miss-register direction from being displayed.

SOLUTION: The vehicle circumference monitoring device 1 picks up an image in a predetermined direction around the vehicle with a camera 7 disposed in the vehicle 5 and displays the picked up image on a display device 9 displayed in the vehicle 5. The device 1 comprises a detecting part for detecting an incoming angle for an incoming destination road of the vehicle 5, a determining part 19 for determining whether or not the image pickup visual field of the camera 7 is directed to a direction including an extending direction of the incoming destination road in response to the detected incoming angle, and a control part 29 for switching and controlling the display or non-display of the picked up image on the display device 9 based on the determining result of the determining part 19.



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CLAIMS

[Claim(s)]

[Claim 1]A vehicle periphery monitoring device which picturizes a determined direction of a vehicle circumference by an imaging means installed in vehicles, and displays this image pick on a displaying means installed in said vehicles, comprising:

A detection means to detect the degree of angle of approach to a penetration place road of said vehicles.

A decision means which judges whether it has turned to a direction in which an imaging visual field of said imaging means includes the installation direction of said penetration place road according to said detected degree of angle of approach, and a control means which responds for whether being whether a decision result of said decision means is suitable, and /no, and carries out switching control of a display / un-displaying on said displaying means of said image pick.

[Claim 2]Said imaging means is installed in anterior part or the rear of said vehicles, picturizes a longitudinal direction of said vehicles, and said detection means, From an approach fix in a penetration place road of said vehicles, detect the degree of angle of approach to each prolonged half-road part, and said decision means, According to a right-and-left individual, according to said each detected degree of angle of approach, an imaging visual field of right and left of said imaging means judges whether it has turned to a direction including the installation direction of said half-road part by the side of it, and said control means, The vehicle periphery monitoring device according to claim 1 characterized by carrying out switching control of a display and un-displaying on said displaying means of the image pick according to a right-and-left individual about an image pick of an imaging visual field on either side based on a decision result of said decision means.

[Claim 3]The vehicle periphery monitoring device according to claim 1 or 2 only when it has further a detection means to detect distance of said vehicles and said penetration place road, and distance of said vehicles and said penetration place road is less than prescribed distance further, wherein said control means displays said image pick on said displaying means.

[Claim 4]An approach fix to said penetration place road is further provided with a detection means to detect whether it is a crossing provided with a signal, and it said control means, The vehicle

periphery monitoring device according to any one of claims 1 to 3 characterized by displaying said image pick on said displaying means only when an approach fix to said penetration place road is not a crossing provided with a signal.

[Claim 5]the vehicle periphery monitoring device according to any one of claims 1 to 4 characterized by displaying said image pick on said displaying means only when it has further a detection means to detect width of a road under run of said vehicles and width of a road under run of said vehicles does not come out of said control means further in more than prescribed width.

[Claim 6]the vehicle periphery monitoring device according to any one of claims 1 to 5 characterized by displaying said image pick on said displaying means only when it has further a detection means to detect a lane number of a road under run of said vehicles and a lane number of a road under run of said vehicles does not come out of said control means further in more than a predetermined number.

[Claim 7]The vehicle periphery monitoring device according to any one of claims 1 to 6, wherein said detection means detects based on car navigation information.

[Claim 8]The vehicle periphery monitoring device according to any one of claims 1 to 7, wherein it has further a detection means to detect an operation condition of said vehicles and said control means carries out switching control of a display and un-displaying on said displaying means of said image pick according to said operation condition further.

[Claim 9]/only when the vehicle speed is not more than a prescribed speed as said operation condition, and also only when a gear position is not except a position which can be moved forward. Or the vehicle periphery monitoring device according to claim 8 characterized by displaying said image pick on said displaying means only when a handbrake is not being pulled.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the art which carries out switching control of a display and un-displaying on the displaying means of an image pick especially about the vehicle periphery monitoring device which displays the image pick of a vehicle circumference on the displaying means installed in vehicles.

[0002]

[Description of the Prior Art] Conventionally, the longitudinal direction of vehicles is picturized with the camera installed in the vehicle front part, and the vehicle periphery monitoring device which enabled it to recognize the longitudinal direction of vehicles visually by a driver by displaying this image pick on the display installed in vehicles is proposed.

[0003] According to this vehicle periphery monitoring device, the driver can check approach vehicles etc. now to early timing also by the situation where a field of view is interrupted by obstacles, such as a building and a wall, and approach vehicles etc. cannot be easily checked like [at the time of the penetration to a crossing, and recession from a motor pool].

[0004] Usually, the display used with this kind of vehicle periphery monitoring device is shared with the display which displays a map and notice information, television, etc. of car navigation. The image picks and those pictures of a camera are displayed selectively.

The display of the image pick of a camera and the non-display change are controlled by the former based on the operation condition of the vehicle speed, a gear position, etc.

[0005]

[Problem(s) to be Solved by the Invention] In a display and non-display control of the image pick of the conventional camera, also when vehicles stop at a traffic signal or traffic congestion, the image pick of a camera may be displayed. However, when it performed seeing the map of car navigation or setting up a destination during the stop by a traffic signal etc. in

many cases and the image pick of the camera was then displayed, the operation which changes the display of the image pick of a camera non-display was required each time, and there was a fault that it was troublesome.

[0006]The technique of registering into car navigation the crossing which displays the image pick of a camera as the technique of solving this fault (automatic registration), The technique of controlling a display and un-displaying of the image pick of a camera using infrastructure information and the technique of judging an intersectional classification from map information and controlling a display and un-displaying of the image pick of a camera are proposed.

[0007]However, in these techniques, when coming out from a motor pool to a road for example, at the first place and the case where the image pick of a camera is not displayed, and the angle of approach to a road are bad, there is a fault that the image pick of the camera of a wrong direction may be displayed on a display.

[0008]Then, there is a technical problem of this invention in providing the vehicle periphery monitoring device with which the image pick of the camera of a wrong direction is not displayed on the 1st, and providing the vehicle periphery monitoring device displayed at the place where the image pick of a camera is [2nd] suitable.

[0009]

[Means for Solving the Problem]In order to solve an aforementioned problem, the invention according to claim 1, A detection means to be a vehicle periphery monitoring device which picturizes a determined direction of a vehicle circumference by an imaging means installed in vehicles, and displays this image pick on a displaying means installed in said vehicles, and to detect the degree of angle of approach to a penetration place road of said vehicles, A decision means which judges whether it has turned to a direction in which an imaging visual field of said imaging means includes the installation direction of said penetration place road according to said detected degree of angle of approach, It responds for whether being whether a decision result of said decision means is suitable, and /no, and has a control means which carries out switching control of a display / un-displaying on said displaying means of said image pick.

[0010]Said imaging means is installed in anterior part or the rear of said vehicles, and the invention according to claim 2 picturizes it, and a longitudinal direction of said vehicles said detection means, From an approach fix in a penetration place road of said vehicles, detect the degree of angle of approach to each prolonged half-road part, and said decision means, According to a right-and-left individual, according to said each detected degree of angle of approach, an imaging visual field of right and left of said imaging means judges whether it has turned to a direction including the installation direction of said half-road part by the side of it, and said control means, Based on a decision result of said decision means, switching control of a display and un-displaying on said displaying means of the image pick is carried out according to a right-and-left individual about an image pick of an imaging visual field on either

side.

[0011]The invention according to claim 3 is further provided with a detection means to detect distance of said vehicles and said penetration place road, and said control means displays said image pick on said displaying means, only when distance of said vehicles and said penetration place road is less than prescribed distance further.

[0012]The invention according to claim 4 is further provided with a detection means to detect whether it is a crossing where an approach fix to said penetration place road is provided with a signal, and further, said control means displays said image pick on said displaying means, only when an approach fix to said penetration place road is not a crossing provided with a signal.

[0013]the invention according to claim 5 is further provided with a detection means to detect width of a road under run of said vehicles, and said control means displays said image pick on said displaying means, only when width of a road under run of said vehicles does not come out further in more than prescribed width.

[0014]the invention according to claim 6 is further provided with a detection means to detect a lane number of a road under run of said vehicles, and said control means displays said image pick on said displaying means, only when a lane number of a road under run of said vehicles does not come out further in more than a predetermined number.

[0015]As for the invention according to claim 7, said detection means detects based on car navigation information.

[0016]The invention according to claim 8 is further provided with a detection means to detect an operation condition of said vehicles, and said control means carries out switching control of a display and un-displaying on said displaying means of said image pick according to said operation condition further.

[0017]a case where a gear position does not come out of the invention according to claim 9 as said operation condition except a position which can be moved forward only when the vehicle speed does not come out in more than a prescribed speed -- only when a handbrake is not being pulled, said image pick is displayed on said displaying means.

[0018]

[Embodiment of the Invention]The composition schematic diagram of the vehicle periphery monitoring device which requires drawing 1 for an embodiment of the invention, and drawing 2, The mimetic diagram in which the figure, drawing 3 - drawing 5 in which the example of installation to the vehicles of the camera of drawing 1 is shown show the example of the directional relation of the direction of the imaging visual field of the camera of drawing 1 and the installation direction of a road, and drawing 6 are the flow chart figures explaining operation of the control section of drawing 1.

[0019]The vehicle periphery monitoring device 1 concerning this embodiment, The camera 7 which is carried in the vehicles 5 carrying the car navigation device 3, for example, is installed

in the anterior part of the vehicles 5, and picturizes the scene of the longitudinal direction of the vehicles 5 simultaneously as shown in drawing 1 and drawing 2, The display 9 in which it is installed in the vehicles 5 and an image pick, a navigation picture, etc. of the camera 7 are displayed, Based on the operation condition of the car navigation information from the car navigation device 3, and the vehicles 5, etc., it has the device main frame 11 which carries out switching control of a display and un-displaying on the display 9 of the image pick of the camera 7, and is constituted. 7L, 7R, and 13 in drawing 2 are an imaging visual field of the right and left of the camera 7, and the range of a driver which can be faced squarely, respectively.

[0020]Main constitution of the camera 7 is carried out, for example using prism and a single image sensor, and it is carrying out optical-path conversion of the image pick-up light from the longitudinal direction of the vehicles 5 with prism, and carrying out image formation to said image sensor simultaneously, and picturizes the scene of the longitudinal direction of the vehicles 5 simultaneously with a single image sensor.

[0021]The angle-of-approach degree primary detecting element 17 where the device main frame 11 detects the degree of angle of approach of the vehicles 5 to the road (henceforth "a penetration place road" is called) 15 into which the vehicles 5 tend to advance, The judgment part 19 which judges whether it has turned to the direction in which the imaging visual fields 7L and 7R of the camera 7 include the installation direction of the penetration place road 15 according to the degree of angle of approach detected by the angle-of-approach degree primary detecting element 17, The distance primary detecting element 21 which detects the distance of the vehicles 5 and the penetration place road 15, and the operation condition primary detecting element 23 which detects the operation condition of the vehicles 5, The traffic information primary detecting element 25 which detects each traffic information of the road under run of the vehicles 5, and the penetration place road 15, The image pick of the camera 7 is equipped with the treating part 27 which performs necessary image processing, and the control section 29 which carries out switching control of a display and un-displaying on the display 9 of the image pick of the camera 7 via the treating part 27 based on the processing result of each part 19, 21, 23, and 25, and it is constituted.

[0022]The angle-of-approach degree primary detecting element 17 detects the penetration place road 15 of the vehicles 5 using the road map information included in car navigation information with reference to drawing 3, and the running information of the vehicles 5, the half-road parts 15L and 15R prolonged from the approach fix 35 in the detected penetration place road 15 – it is alike, respectively and the degrees beta and alpha of angle of approach of the vehicles 5 to receive are detected. Here, the approach fix 35 is given as the intersection points of the straight line and the penetration place road 15 which were carried in the continuation from the current position of the vehicles 5 to the running direction P1 of the vehicles 5, or

intersection points of the recommended route and the penetration place road 15 which were calculated by the navigation device, for example.

[0023]Below, the above-mentioned degree alpha of angle of approach (beta) is used as an angle of deflection of the installation direction P3 (P2) of the half-road part 15R (15R) of the penetration place road 15 of the circumference of the right [on the basis of the running direction P1 of the vehicles 5] (left).

[0024]According to each degrees alpha and beta of angle of approach detected with reference to drawing 3, the judgment part 19, According to a right-and-left individual, in the left (right) angle-of-deflection range beta 1 of imaging visual field 7L (7R) of the camera 7 - beta2 (alpha1-alpha2), By whether the angle of deflection beta (alpha) of the installation direction P2 (P3) of the half-road part 15L (15R) of the penetration place road 15 is included, and it being judged whether it is /no. Left (right) imaging visual field 7L (7R) of the camera 7 judges whether they are whether it has turned to the direction including the installation direction P2 (P3) of the half-road part 15L (15R) by the side of it, and /no. beta 1 and beta 2 (alpha 1, alpha 2) are an angle of deflection of the left (right) last borderline ray of imaging visual field 7L (7R) of the circumference of the left [on the basis of the running direction P1 of the vehicles 5] (right), and an angle of deflection of a back borderline ray, respectively.

[0025]For example, in the case of drawing 3, the judgment part 19 in the angle-of-deflection ranges beta1-beta2 of the imaging visual fields 7L and 7R of the right and left of the camera 7, alpha 1 - alpha2, respectively, Since the installation direction P2 of the half-road parts 15L and 15R of the penetration place road 15 and the angles of deflection beta and alpha of P3 are included, it is judged that the imaging visual fields 7L and 7R of the right and left of the camera 7 have turned to the installation direction P2 of the half-road parts 15L and 15R by the side of it, and the direction containing P3, respectively. In the case of drawing 4 and drawing 5, the judgment part 19, Since the angle of deflection beta of the installation direction P2 of the half-road part 15L of the penetration place road 15 is included in the angle-of-deflection range beta 1 of the imaging visual field 7L on the left of the camera 7 - beta2, About the imaging visual field 7L on the left of the camera 7, it is judged that the direction including the installation direction P2 of the half-road part 15L by the side of it is suitable, Since the angle of deflection alpha of the installation direction of the half-road part 15R of the penetration place road 15 is not included in the angle-of-deflection range alpha 1 of the imaging visual field 7R on the right of the camera 7 - alpha2, about the imaging visual field 7R on the right of the camera 7, it is judged that the direction including the installation direction P3 of the half-road part 15R by the side of it is not suitable.

[0026]Based on car navigation information, the distance h of the current position (or anterior part of the vehicles 5) of the vehicles 5 and the approach fix 35 on the penetration place road 15 is detected, and the distance primary detecting element 21 judges whether the detected

distance h is less than prescribed distance, as shown in drawing 3. As the above-mentioned prescribed distance h , the position detection error of the car navigation device 3 is taken into consideration, and it is set as 20-5m, for example.

[0027]The operation condition primary detecting element 23 has the following.

For example, the function to detect the vehicle speed of the vehicles 5 and to judge whether the detected vehicle speed is more than a prescribed speed.

The function to detect whether the gear position of the vehicles 5 is except the positions (a drive, LO, a neutral, etc.) which can be moved forward.

The function to detect whether the handbrake is being pulled or not.

[0028]The traffic information primary detecting element 25 has the following.

For example, the function to judge whether the approach fix 35 to the penetration place road 15 is a crossing provided with a signal based on car navigation information.

The function to judge whether the width which detected and detected the width of the road under run of the vehicles 5 is more than prescribed width (for example, not less than 13 m).

The function to judge whether the lane number which detected and detected the lane number of the road under run of the vehicles 5 is more than a predetermined number (for example, two lanes).

[0029]The treating part 27 makes the image pick of the imaging visual fields 7L and 7R of the right and left of the camera 7 a display and non-display according to a right-and-left individual by control of the control section 29 at the left half plane of the display screen of the display 9, and a right half plane, respectively.

[0030]The control section 29 carries out switching control of a display and un-displaying on the display 9 of the image pick according to a right-and-left individual via the treating part 27 based on the detection result of each primary detecting elements 21, 23, and 25, and the decision result of the judgment part 19 about the image pick of each imaging visual fields 7L and 7R of the right and left of the camera 7. In detail, the control section 29 carries out switching control of a display and un-displaying on the display 9 of the image pick of the imaging visual fields 7L and 7R of the right and left of the camera 7 according to the flow chart of drawing 6.

[0031]That is, when it judges whether the distance h of the vehicles 5 and the penetration place road 15 is less than prescribed distance and judges as less than prescribed distance at Step S1 based on the detection result of the distance primary detecting element 21, it progresses to Step S2.

[0032]In Step S2, an operation condition based on the detection result of the operation condition primary detecting element 23 as a predetermined condition, ** when it progresses to Step S3 when it is judged that the vehicle speed of the vehicles 5 does not come out in more

than a prescribed speed and that it judges whether all the conditions that the gear position of the ** vehicles 5 does not come out except the position which can be moved forward, and that ** handbrake is not being pulled are fulfilled, and fills, and it is judged that it does not fill, return to Step S1.

[0033]In Step S3, a traffic information based on the detection result of the traffic information primary detecting element 25 as a predetermined condition, **. The approach fix 35 to the penetration place road 15 is not a crossing provided with a signal. ** in more than prescribed width, the width of the road under run of the vehicles 5 does not come out -- in more than a predetermined number, the lane number of the road under run of the ** vehicles 5 does not come out. When it judges whether all the conditions to say are fulfilled and it is judged that it fills, it progresses to step S4 and S7, and when it is judged that step S4 - S6, and Step S7 - S9 are processed, and are not filled, it returns to Step S1.

[0034]It is judged whether in step S4, it has turned to the direction in which the imaging visual field 7R on the right of the camera 7 includes the installation direction P3 of the half-road part 15R by the side of it based on the decision result of the judgment part 19, When it is judged that it is suitable, progress to Step S5 and via the treating part 27, The right half plane of the display screen of the display 9 is made to indicate the image pick of the imaging visual field 7R on the right of the camera 7 by fixed time, and another side and when it is judged that it is not suitable, it progresses to Step S6 and is made not to display the image pick of the imaging visual field 7R on the right of the camera 7 on the display 9.

[0035]It is judged whether in Step S7, it has turned to the direction in which the imaging visual field 7L on the left of the camera 7 includes the installation direction P2 of the half-road part 15L by the side of it based on the decision result of the judgment part 19, When it is judged that it is suitable, progress to Step S8 and via the treating part 27, The left half plane of the display screen of the display 9 is made to indicate the image pick of the imaging visual field 7L on the left of the camera 7 by fixed time, and another side and when it is judged that it is not suitable, it progresses to step S9 and is made not to display the image pick of the imaging visual field 7L on the left of the camera 7 on the display 9.

[0036]When having turned to the direction P2 and P3 in which the imaging visual fields 7L and 7R of the right and left of the camera 7 include the installation direction of the half-road parts 15L and 15R by the side of it, respectively, for example like drawing 3 by the above-mentioned step S4 - S9, Namely, when the vehicles 5 advance into the penetration place road 15 and the installation direction P2 of the half-road parts 15L and 15R of the both sides of the penetration place road 15 and P3 are appropriately picturized by the imaging visual fields 7L and 7R of the right and left of the camera 7 (refer to drawing 2), The image pick of the imaging visual fields 7L and 7R of both right and left is displayed on the display 9.

[0037]Although it has turned to the direction including the installation direction P2 of the half-

road part 15L by the side of it about one imaging visual field 7L of the camera 7, for example like drawing 4 and drawing 5, When not having turned to the direction including the installation direction P3 of the half-road part 15R by the side of it about the imaging visual field 7R of another side of the camera 7, Namely, when the vehicles 5 advance into the penetration place road 15, in one imaging visual field 7L of the camera 7, the installation direction P2 of the half-road part 15L by the side of it of the penetration place road 15 is picturized appropriately, but. In the imaging visual field 7R of another side of the camera 7, when the installation direction P3 of the half-road part 15R by the side of it of the penetration place road 15 is not picturized appropriately, only the image pick of concerned one imaging visual field 7L is displayed on the display 9, and the image pick of the imaging visual field 7R of the another side concerned is not displayed on it.

[0038]When neither of imaging visual fields 7L and 7R of the right and left of the camera 7 have turned to the installation direction P2 of the half-road parts 15L and 15R by the side of it, and the direction containing P3, neither of image pick of the imaging visual fields 7L and 7R on either side is displayed on the display 9.

[0039]According to the vehicle periphery monitoring device 1 constituted as mentioned above, according to the degrees alpha and beta of angle of approach to the penetration place road 15 of the vehicles 5, It is judged whether they are whether the imaging visual fields 7L and 7R of the camera 7 have turned to the installation direction P2 of the penetration place road 15 and the direction containing P3 and /no, Since switching control of a display / un-displaying on the display 9 of an image pick is carried out based on this judgment, For example, at the time of the penetration to a crossing, and recession from a motor pool, the degree of angle of approach to the penetration place road 15 of the vehicles 5 is bad, The imaging visual fields 7L and 7R of the camera 7 the installation direction P2 of the penetration place road 15, and the direction containing P3 in the situation (namely, situation which approach vehicles cannot picturize appropriately) of not being suitable. It can avoid displaying the image pick of the camera 7 on the display 9, and, thereby, the driver can exclude the useless labor which pays attention to the image pick of a wrong direction.

[0040]each half-road parts 15L and 15R -- it being alike, respectively, and the receiving degrees alpha and beta of angle of approach being detected, and, It is judged whether according to these each degrees alpha and beta of angle of approach, the imaging visual fields 7L and 7R of the right and left of the camera 7 have turned to the installation direction P2 of the half-road parts 15L and 15R by the side of it and the direction containing P3 according to the right-and-left individual, About the image pick of the imaging visual fields 7L and 7R on either side, since switching control of a display and un-displaying on the display 9 of the image pick is carried out according to a right-and-left individual, only the image pick of a wrong direction can be individually made non-display, and even the image pick picturized

appropriately can prevent being made non-display.

[0041] Since an image pick is displayed on the display 9 only when the distance h of the vehicles 5 and the penetration place road 15 is less than prescribed distance, the display to the display 9 of an image pick can be performed at the suitable place in consideration of the distance h of the vehicles 5 and the penetration place road 15.

[0042] since it sees when the approach fix 35 on the penetration place road 15 is not a crossing provided with a signal, and an image pick is displayed on the display 9, there is a signal, and in the situation which does not need the image pick of the camera 7, an image pick does not need to be displayed on the display 9 and can prevent the display of a useless image pick.

[0043] Only when the width of the road under run of the vehicles 5 is not more than prescribed width, and only when the lane number of the road under run of the vehicles 5 is not more than predetermined. Since an image pick is displayed on the display 9, like [at the time of a run of the road where width is wide, and a run of a road with many lane numbers], in an unnecessary situation, the image pick of an imaging means can be prevented from displaying an image pick on the display 9, and can prevent the display of a useless image pick.

[0044] In each part 17, 21, and 25, since detection is performed based on car navigation information, when the car navigation device 3 is carried in the vehicles 5, the car navigation information on the car navigation device 3 can be used, and it can detect by a cheap technique.

[0045] Since switching control of a display and un-displaying on the display 9 of an image pick is carried out according to an operation condition, the display and the non-display change to the display 9 of an image pick can be performed in the suitable situation according to an operation condition. Especially, as an operation condition, only when the vehicle speed is not more than a prescribed speed, Since an image pick is displayed on the display 9 only when a gear position is not except the position which can be moved forward, and only when the handbrake is not being pulled further, as an operation condition, In clearly unnecessary situations, such as a case where the vehicle speed is more than fixed, a case where there is a gear position in addition to the position which can be moved forward, and a case where the handbrake is being pulled, the image pick of the camera 7 can be prevented from displaying an image pick on the display 9, and can prevent the display of a useless image pick.

[0046] Although this embodiment explained by the case where the camera which picturizes the scene of a longitudinal direction simultaneously with a single image sensor is used as the camera 7, For example, the camera 7a for the lefts and the camera 7b for the rights are installed in the both ends of the anterior part of the vehicles 5, respectively, and you may make it picturize a leftward scene and a rightward scene with these each cameras 7a and 7b, as shown in drawing 7.

[0047] Although this embodiment explained by the case where various kinds of detection is

performed using navigation information, the information from the device which sends the road traffic information currently installed in the road may be used instead of being navigation information.

[0048]In addition -- registering further the place on which you want to display an image pick in this embodiment (a position or a position, and an approach direction) -- that place -- unconditionedness -- an image pick -- a display -- or you may carry out as [carry out / non-display].

[0049]In this embodiment, you may carry out as [display / an image pick] at the place judged that there is no necessity from the map information of navigation information.

[0050]In this embodiment, although the camera 7 was installed in the anterior part of the vehicles 5, you may install in the rear of the vehicles 5.

[0051]

[Effect of the Invention]According to the invention according to claim 1, according to the degree of angle of approach to the penetration place road of vehicles, Have turned to the direction in which the imaging visual field of an imaging means includes the installation direction of a penetration place road, or it is judged in /no, Since switching control of a display / un-displaying on the displaying means of an image pick is carried out based on this judgment, For example, in the situation of not being suitable, the direction in which the degree of angle of approach to the penetration place road of vehicles is bad, and the imaging visual field of an imaging means includes the installation direction of a penetration place road at the time of the penetration to a crossing, and recession from a motor pool. It can avoid displaying the image pick of an imaging means on a displaying means, and, thereby, the driver can exclude the useless labor which pays attention to the image pick of a wrong direction.

[0052]According to the invention according to claim 2, the degree of angle of approach to each of each half-road part is detected, / is judged [whether according to these each degree of angle of approach, it has turned to the direction to which the imaging visual field of the right and left of an imaging means includes the installation direction of the half-road part by the side of it according to a right-and-left individual, and], Since switching control of a display / un-displaying on the displaying means of that image pick is carried out according to a right-and-left individual about the image pick of an imaging visual field on either side based on this judgment, only the image pick of a wrong direction can be individually made non-display, and even the image pick picturized appropriately can prevent being made non-display.

[0053]According to the invention according to claim 3, since an image pick is displayed on a displaying means only when the distance of vehicles and a penetration place road is less than prescribed distance, the display to the displaying means of an image pick can be performed at the suitable place in consideration of the distance of vehicles and a penetration place road.

[0054]According to the invention according to claim 4, since an image pick is displayed on a

displaying means only when the approach fix on a penetration place road is not a crossing provided with a signal, there is a signal, and in an unnecessary situation, the image pick of an imaging means can be prevented from displaying an image pick on a displaying means, and can prevent the display of a useless image pick.

[0055]Since according to the invention according to claim 5 an image pick is displayed on a displaying means only when the width of the road under run of vehicles is not more than prescribed width, Like [at the time of a run of the road where width is wide], in an unnecessary situation, the image pick of an imaging means can be prevented from displaying an image pick on a displaying means, and can prevent the display of a useless image pick.

[0056]Since according to the invention according to claim 6 an image pick is displayed on a displaying means only when the lane number of the road under run of vehicles is not more than a predetermined number, Like [at the time of a run of a road with many lane numbers], in an unnecessary situation, the image pick of an imaging means can be prevented from displaying an image pick on a displaying means, and can prevent the display of a useless image pick.

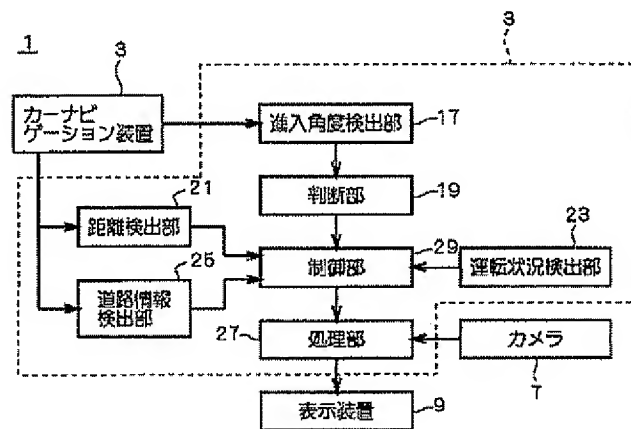
[0057]According to the invention according to claim 7, since detection is performed based on car navigation information, when a car navigation device is carried in vehicles, the car navigation information on the car navigation device can be used, and it can detect by a cheap technique.

[0058]According to the invention according to claim 8, since switching control of a display and un-displaying on the displaying means of an image pick is carried out according to an operation condition, the display and the non-display change to the displaying means of an image pick can be performed in the suitable situation according to an operation condition.

[0059]Only when the vehicle speed is not more than a prescribed speed as an operation condition according to the invention according to claim 9, Since an image pick is displayed on a displaying means only when a gear position is not except the position which can be moved forward, or/and only when the handbrake is not being pulled further, as an operation condition, In clearly unnecessary situations, such as a case where the vehicle speed is more than fixed, a case where there is a gear position in addition to the position which can be moved forward, and a case where the handbrake is being pulled, the image pick of an imaging means can be prevented from displaying an image pick on a displaying means, and can prevent the display of a useless image pick.

[Translation done.]

Drawing selection Representative drawing



[Translation done.]